

# **R175**

## **Compact Receiver**

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### **OPERATING INSTRUCTIONS and trouble-shooting guide**

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**Digital Code Squelch**

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**LECTROSONICS, INC.**

Rio Rancho, NM

## INTRODUCTION

The R175 is a fixed frequency, crystal controlled receiver designed for use in public address applications. A proprietary Digital Code Squelch\* is used in the system design to eliminate squelching problems caused by interference. The compact size of the receiver permits mounting the receiver almost anywhere. The audio output is a balanced XLR type, variable in level, to match any type of sound system.

The digital code system provides much more reliable control over the receiver audio output than a conventional squelch can provide. The matching transmitter generates a 9-bit code at turn on, and another code at turn off, to open and close the audio output on the receiver. The squelch on the receiver cannot be opened by anything other than the specific code it is programmed to receive. This type of squelch system is even more important when the receiver is connected into an automatic mixing system.

The R175 circuitry utilizes the latest surface mount technology, with significant oscillator shielding. Up to four systems can be operated simultaneously in close proximity in the 169 to 172 MHz band without intermodulation, crosstalk or squelch problems. The housing is a durable aluminum extrusion with rugged connectors for lasting reliability.

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## RECEIVER FRONT PANEL

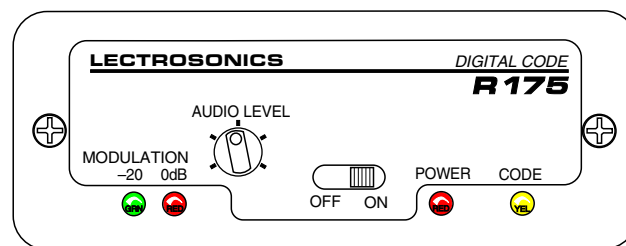
**-20 and 0dB LEDs** - Indicates the modulation (audio level) of the incoming signal - see transmitter manual for proper adjustment of transmitter "MIC LEVEL" or "GAIN." The -20 lamp should flicker, or stay lit as you speak into the microphone. The 0dB lamp is a "peak" indicator showing that the audio level in the transmitter is being limited. It is normal to see an occasional flicker of the 0dB lamp.

**OFF-ON Switch** - This slide switch turns the power off and on.

**POWER LED** - Glows when the switch is in the "ON" position and the power source is good, or when the AC adapter is properly connected. If this LED is very dim or does not light up when the switch is turned on, check the power source.

**CODE LED** - Lights when the transmitter is turned on and the internal code in the transmitter matches this particular receiver. If the receiver is turned on after the transmitter, the code led will not come on. In this case, it will be necessary to turn the transmitter off and back on to enable the receiver. When the carrier signal from the transmitter is too weak to produce a clean audio signal the receiver will squelch (no audio) but the code lamp will remain lit.

**AUDIO LEVEL** - This is an attenuator used to regulate the output level of the receiver. When fully counter-clockwise, the output of the XLR jack on the rear panel will be fully attenuated. When fully clockwise, the output level will be similar to a high output electret microphone. Intermediate settings are often necessary to ideally match the level with other equipment.



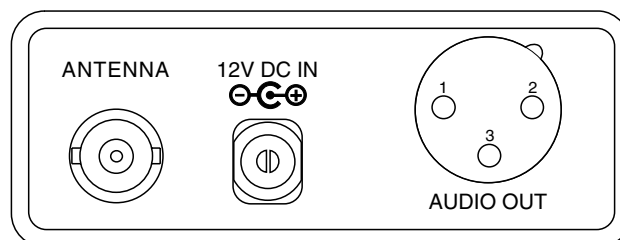
## RECEIVER REAR PANEL

**ANTENNA terminal** - A standard BNC connector compatible with the supplied antenna.

**12 VDC IN** - Connect the power supply here - the CH-12 AC adapter is supplied with the receiver for powering the unit from a 110V AC source. The receiver may also be powered from an 12 to 18 VDC @ 98mA source using the correct plug (Switchcraft S-760 , 2.1mm coaxial power plug.) The center pin on the receiver jack is positive (+).

**AUDIO OUT** (standard XLR jack) - This is the audio output that should connect into your sound system. Being such a common type of connector, many different adapters and cords are available from local audio or electronics dealers in your area, or from the factory. The pin configuration is:

- Pin 1 - shield
- Pin 2 - Audio (+)
- Pin 3 - Audio (-)



## SYSTEM SETUP AND OPERATION

- 1) Connect the supplied CH-12 to the power jack on the rear panel.
- 2) Attach the antenna.
- 3) Connect the audio cable.

XLR Output:       Pin 1 - ground  
                      Pin 2 - audio (+)  
                      Pin 3 - audio (-)

- 4) Set front panel switch to "ON." Check to see that the red POWER LED lights up.
- 5) Adjust transmitter "GAIN."

This is perhaps the most important step in the set up procedure. (see your transmitter manual for specific instructions on the proper gain adjustment of your transmitter)

- 6) Adjust AUDIO LEVEL control according to the type of input on your equipment. The input levels on different equipment vary which may require that you set the AUDIO LEVEL control in an intermediate position of the control. Try different settings and listen to the results. If the output of the receiver is too high, you may hear distortion or a loss of the natural dynamics of the audio signal. If the output is too low, you may hear steady noise (hiss) along with the audio.

*Note: Do not use the transmitter GAIN control to adjust the loudness of your sound system.*

## INDICATOR QUICK REFERENCE

**CODE** - This yellow LED lights up when the transmitter is turned on. This indicates that the receiver is getting an adequate RF signal (carrier) from the transmitter and that the code from the transmitter matches the preset code embedded in the receiver.

**POWER** - This red LED lights up when the receiver is properly connected to a power supply and switched on.

**-20 and 0dB** - The green LED (marked -20) lights up when an audio signal is present at an adequate level to produce a good signal to noise ratio. The red LED (marked 0dB) lights up when the audio level is being compressed in the transmitter. An extremely high audio level may also cause distortion.

***REVIEW THE TRANSMITTER INSTRUCTION MANUAL FOR PROPER ADJUSTMENT AND SETUP OF THE TRANSMITTER MIC LEVEL***

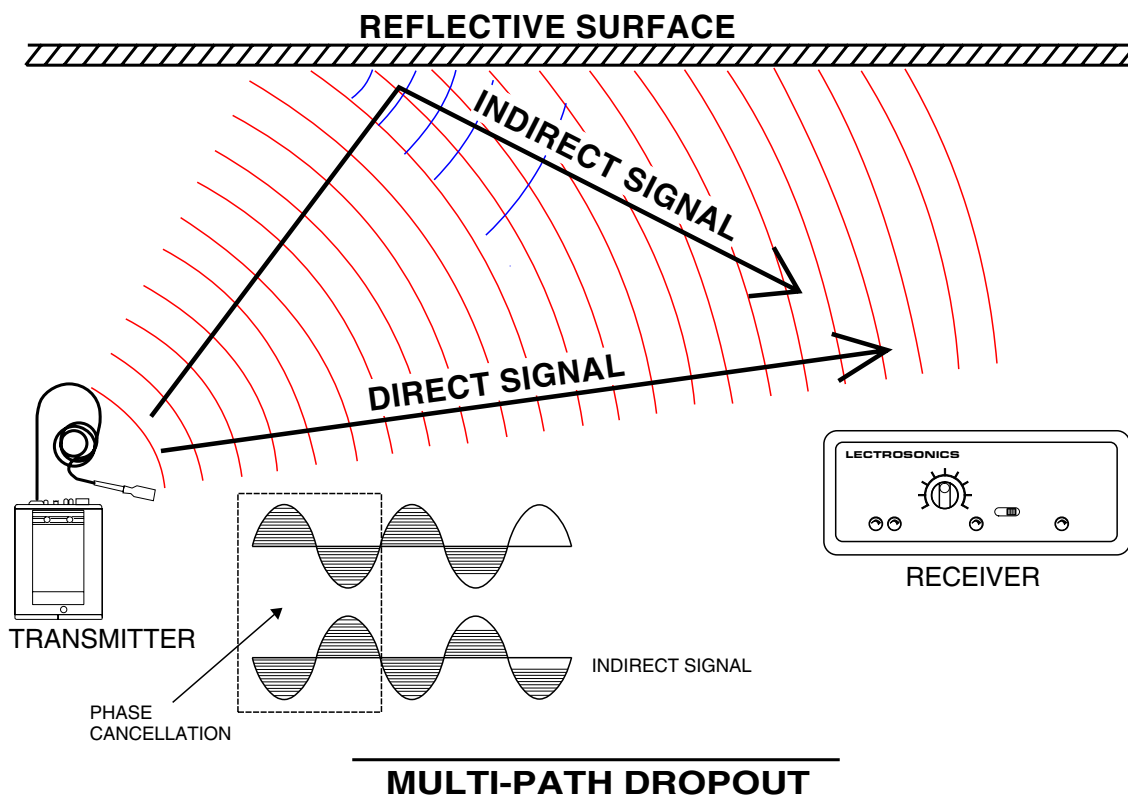
## ANTENNA USE AND PLACEMENT

Connect the antenna to the rear panel jack. Extend the antenna fully if you are using a telescoping type. Position the antenna so that it is not touching or within 3 or 4 feet of large metal surfaces. It is also good practice to position the receiver so that there is a direct "line of sight" between the transmitter and the receiver antenna. If the antenna needs to be placed away from the receiver, use a proper external antenna. Use of the supplied whip antenna on the end of a coax cable with no ground plane is not recommended and may result in poor RF performance.

A wireless transmitter sends a radio signal out in all directions. This signal will often bounce off nearby walls, ceilings, etc. and a strong reflection can arrive at the receiver antenna along with the direct signal. If the direct and reflected signals are out of phase with each other a cancellation may occur. The result would be a "dropout." A dropout sounds like either audible noise (hiss), or in severe cases, may result in a complete loss of the sound when the transmitter is positioned in certain locations in the room. A dropout normally sounds like "hum" or "hiss." Moving the transmitter even a few inches will change the sound of the hum or hiss, or eliminate it. A dropout situation may be either better or worse as the crowd fills and/or leaves the room.

In the event that you do encounter a dropout problem, first try moving the receiver/antenna at least 3 or 4 feet from where it was. This may alleviate the dropout problem. If dropouts are still a problem, try moving the receiver and/or the antenna to an entirely different location in the room.

Lectrosonics transmitters radiate more power, and the receivers are more sensitive than any other on the market. This reduces dropouts to an insignificant level. If, however, you do encounter dropouts frequently, call the factory. There is probably a simple solution.



## TROUBLESHOOTING

Before going through the following chart, be sure that you have a good battery in the transmitter. It is important that you follow these steps in the sequence listed.

<b>SYMPTOM</b>	<b>POSSIBLE CAUSE</b>
<b>TRANSMITTER BATTERY LED OFF</b>	<ol style="list-style-type: none"> <li>1) Battery is inserted backwards.</li> <li>2) Battery is dead.</li> </ol>
<b>RECEIVER CODE LAMP OFF</b>	<ol style="list-style-type: none"> <li>1) Transmitter not turned on.</li> <li>2) Transmitter battery is dead.</li> <li>3) Receiver antenna missing or improperly positioned.</li> <li>4) Transmitter and receiver not on same frequency. Check labels on transmitter and receiver.</li> <li>5) Transmitter and receiver do not have the same internal code. Check labels on transmitter and receiver.</li> <li>5) Operating range is too great.</li> </ol>
<b>NO SOUND BUT RECEIVER MOD LEVEL LEDs ARE ON</b>	<ol style="list-style-type: none"> <li>1) Receiver audio output is disconnected or cable is defective or mis-wired.</li> <li>2) Sound system or recorder input is turned down.</li> </ol>
<b>DISTORTED SOUND</b>	<ol style="list-style-type: none"> <li>1) Transmitter gain (MIC LEVEL) is too high. Speak or sing into the transmitter and check mod level lamps on the receiver.</li> <li>2) Receiver output may be mis-matched with the sound system or recorder input.</li> <li>3) Excessive wind noise or breath "pops." Use windscreen or re-position the microphone.</li> </ol>
<b>HISS AND NOISE - AUDIBLE DROPOUTS</b>	<ol style="list-style-type: none"> <li>1) Transmitter gain (MIC LEVEL) too low.</li> <li>2) Receiver antenna missing or obstructed.</li> <li>3) Operating range too great.</li> </ol>
<b>EXCESSIVE FEEDBACK</b>	<ol style="list-style-type: none"> <li>1) Transmitter gain (audio level) too high. Check gain adjustment and/or reduce receiver output.</li> <li>2) Microphone too close to speaker system.</li> <li>3) Microphone too far from the user's mouth.</li> </ol>

## REPLACEMENT PARTS and ACCESSORIES

<u>Part No.</u>	<u>Description</u>
CH-12	110 Volt AC adapter for receiver
A-185BNC	Telescoping, swivel-mount antenna with BNC plug
A-185COAX	Remote folded dipole coaxial antenna for VHF receivers
A-170AC	Straight whip antenna with BNC plug
A-200	Dipole antenna with dual whips & aluminum base
M119-MICRO	Lavalier microphone, omni-directional pattern
M140-MICRO	Lavalier microphone, cardioid pattern
M150-MICRO	Lavalier microphone, omni-directional pattern with added high frequency response

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## SPECIFICATIONS AND FEATURES

<b>Operating Frequencies:</b>	169 to 198 MHz, crystal controlled
<b>RF Sensitivity:</b>	-110 dBm for 20 dB Sinad (0.7 uV)
<b>IF Selectivity:</b>	150 kHz interference bandwidth; -30 dB @ $\pm 200$ kHz
<b>Squelch Quieting:</b>	-109 dB
<b>AM Rejection:</b>	Below the noise at all input levels
<b>Modulation Acceptance:</b>	$\pm 15$ kHz
<b>Third Order Intercept:</b>	+5 dBm
<b>Distortion:</b>	0.5% @ 1 kHz, 12 kHz deviation (system)
<b>Signal/Noise Ratio:</b>	-90 dB (system)
<b>Audio Outputs:</b>	XLR: 200 Ohms bal; 100 mV max.
<b>Antenna Input:</b>	BNC; 50 Ohms impedance
<b>Controls:</b>	Front panel attenuator controls XLR output; 2 position power/function switch
<b>Indicators:</b>	Red LED for power ON; 2 LEDs for modulation level; Yellow LED for CODE ON
<b>Power Requirements:</b>	Unit accepts 12 to 18 VDC. Polarity protected, standard 2.1mm coaxial power jack accepts Switchcraft S760 or equivalent plug. 110 Volts AC via CH-12 AC adapter
<b>Power Consumption:</b>	98 mA @ 12 kHz deviation, 72 mA @ idle
<b>Weight:</b>	8.4 oz. without antenna
<b>Dimensions:</b>	1.25 x 3.25 x 5.15 inches

## SERVICE AND REPAIR

If your system malfunctions, you should attempt to correct or isolate the trouble before concluding that the equipment needs repair. Make sure you have followed the setup procedure and operating instructions. Check out the interconnecting cords and then go through the TROUBLE SHOOTING section in the manual

We strongly recommend that you **do not** try to repair the equipment yourself and **do not** have the local repair shop attempt anything other than the simplest repair. If the repair is more complicated than a broken wire or loose connection, send the unit to the factory for repair and service. Don't attempt to adjust any controls inside the units. Once set at the factory, the various controls and trimmers do not drift with age or vibration and never require readjustment. **There are no adjustments inside that will make a malfunctioning unit start working.**

LECTROSONICS service department is equipped and staffed to quickly repair your equipment. In-warranty repairs are made at no charge in accordance with the terms of the warranty. Out of warranty repairs are charged at a modest flat rate plus parts and shipping. Since it takes almost as much time and effort to determine what is wrong as it does to make the repair, there is a charge for an exact quotation. We will be happy to quote approximate charges by phone for out of warranty repairs.

## RETURNING UNITS FOR REPAIR

You will save yourself time and trouble if you will follow the steps below:

- A.** DO NOT return equipment to the factory for repair without first contacting us by letter or by phone. We need to know the nature of the problem, the model number and the serial number of the equipment. We also need a phone number where you can be reached 8 am to 4 pm (Mountain Standard Time).
- B.** After receiving your request, we will issue you a return authorization number (R.A.). This number will help speed your repair through our receiving and repair departments. The return authorization number must be clearly shown on the outside of the shipping container.
- C.** Pack the equipment carefully and ship to us, shipping costs prepaid. If necessary, we can provide you with the proper packing materials. UPS is usually the best way to ship the units. Heavy units should be "double-boxed" for safe transport.
- D.** We also strongly recommend that you insure the equipment, since we cannot be responsible for loss of or damage to equipment that you ship. Of course, we insure the equipment when we ship it back to you.

**Mailing address:**

Lectrosonics, Inc.  
PO Box 15900  
Rio Rancho, NM 87174  
USA

**Shipping address:**

Lectrosonics, Inc.  
581 Laser Rd.  
Rio Rancho, NM 87124  
USA

**Telephones:**

Regular: (505) 892-4501  
Toll Free (800) 821-1121  
FAX: (505) 892-6243

**World Wide Web:** <http://www.lectrosonics.com>

**Email:** [sales@lectrosonics.com](mailto:sales@lectrosonics.com)



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## LIMITED ONE YEAR WARRANTY

The equipment is warranted for one year from date of purchase against defects in materials or workmanship provided it was purchased from an authorized dealer. This warranty does not cover equipment which has been abused or damaged by careless handling or shipping. This warranty does not apply to used or demonstrator equipment.

Should any defect develop, Lectrosonics, Inc. will, at our option, repair or replace any defective parts without charge for either parts or labor. If Lectrosonics, Inc. cannot correct the defect in your equipment, it will be replaced at no charge with a similar new item. Lectrosonics, Inc. will pay for the cost of returning your equipment to you.

This warranty applies only to items returned to Lectrosonics, Inc. or an authorized dealer, shipping costs prepaid, within one year from the date of purchase.

This Limited Warranty is governed by the laws of the State of New Mexico. It states the entire liability of Lectrosonics Inc. and the entire remedy of the purchaser for any breach of warranty as outlined above. NEITHER LECTROSONICS, INC. NOR ANYONE INVOLVED IN THE PRODUCTION OR DELIVERY OF THE EQUIPMENT SHALL BE LIABLE FOR ANY INDIRECT, SPECIAL, PUNITIVE, CONSEQUENTIAL, OR INCIDENTAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THIS EQUIPMENT EVEN IF LECTROSONICS, INC. HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. IN NO EVENT SHALL THE LIABILITY OF LECTROSONICS, INC. EXCEED THE PURCHASE PRICE OF ANY DEFECTIVE EQUIPMENT.

This warranty gives you specific legal rights. You may have additional legal rights which vary from state to state.

### **LECTROSONICS, INC.**

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